Automotive Industry Development Centre

Case Study

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Natstan Wire
TPM Cluster Programme

Natstan Wire decided to improve its manufacturing processes and to achieve a higher level of competitive performance by implementing the following:

1. Identify process losses and make them more visible.

2. Develop and empower teams to identify and remove the cause of each problem or loss.

3. To standardize the improved working methods.

The TPM Cluster Programme is a very powerful and efficient way to achieve these goals.

Peet Claassen

Plant Manager

Overview

Company: Natstan Wire

Location: 48 Mel Brookes
Uitenhage
6229
Republic of South Africa

Number of employees: 67

Core products & processes:
Bead wire drawing and plating

Programme period: 24 Months

Company Background

Natstan Wire (Pty) Ltd, a Company in the Natstan Manufacturing group and formerly part of National-Standard Company of Niles U.S.A., was established in 1958 for the manufacture of tyre bead wire. The plant is situated near the harbour city of Port Elizabeth.

The Company manufactures reliable, high quality but economical bead wires which are supplied to major international companies. These include Goodyear, Bridgestone, Continental and Dunlop.

Natstan has also expanded its product range over the years to include copper plated steel wire, nail wire, rivet wire and spring wire. The most modern drawing machinery has been installed to ensure that wire of the highest quality is produced. All wire manufactured undergoes strict quality testing to ensure that the products meet all required specifications.

Natstan has an ISO TS16949 quality accreditation.

Key Challenges Faced

- Budget constraints to make investments on new equipment/software
- No recording of minor breakdowns, analysing causes and monitoring trends.
- Not optimising the machine speed due to low customer demand
- Poor workplace organisation, implementation of 5s
- Motion loss. Equipment not readily available at workstation.

Goals

By implementing Autonomous Maintenance and Focused Improvement the following was addressed:

- Inspection of the machine by the operators to identify abnormalities and fixing the abnormalities before they lead to breakdowns.
- Single Minute Exchange of Dies studies to reduce change overs and move equipment closer to the workstation.
- Implementation of 5s. Having all tools that are required at the workstation.
- Production studies to identify the 6 big losses affecting the Overall Equipment Effectiveness.
- Increasing the OEE through problem solving and eliminating reoccurrences of abnormalities.
- Train operators and management on 5s, OEE, 6 big losses, visual management, SMED and problem solving. This will improve operator involvement.

By implementing Quality Maintenance and Planned Maintenance the following will be addressed:

- Implementing maintenance standards, maintenance schedules, identifying root cause of breakdowns.
- Monitoring losses and tracking losses on visual boards.
- Operator involvement through continuous improvement activities such as Kaizens

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Figure 1: Initial cleaning and inspection of machine.

Figure 2: Sifting and sorting of the model area. Removing all unwanted tools and establishing an area standard.

Figure 3: Identifying sources of contamination that leads to forced deterioration and breakdowns

Programme Journey

Total Productive Maintenance (TPM) is more than a program it is an on-going process. “To change mind set and processes takes time”

The goal of the TPM program is to markedly increase production, equipment efficiency and reduce costs while, at the same time, increasing employee morale and job satisfaction. Natstan implemented the TPM programme in order to stay globally competitive and to focus on the above mentioned goals.

The AIDC started the 12 month programme implementation in January 2013. Peet Claassen the TPM champion identified the MF3 drawing machine as the model area to focus on wire breaks, optimising machine speed/output, reducing costs and breakdowns.

A kick off meeting was held to inform all employees of the new TPM programme. The staff from the model area along with the TPM team and managers was given a formal introduction to TPM. Training on Step 0 and Step 1 Autonomous Maintenance (independent operator maintenance) was performed.

The model machine was analysed and various production studies performed with the goal to identify all abnormalities and identify opportunities for improvement. Cleaning equipment and required changeover/breakdown tools were made available at the machine reducing non value adding losses to look for tools during production.

The program has well defined milestones and KPI’s to monitor the results during the 12 month journey. Through the first 12 months of implementation Natstan has seen the benefits of the programme and decided to renew the 12 month contract in 2014 for the second stage of TPM.

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Before

After

Figure 4: Dies modified to improve fastening and removing of dies. Material of the dies was changed from brass dies to stainless steel.

Before

After

Figure 5: Rubber sealing strip added on all die boxes to seal with lid cover when the machine is running

Programme Master Plan

Item	Objective Description	Timeline 2013											
		J	F	M	A	M	J	J	A	S	O	N	D
1	TPM kick off. Selecting the model area.	■											
2	Production studies to identify 6 big losses	■											
3	Subproject 1: Implementation of Step 0 & Step 1 of Autonomous maintenance		■	■	■								
4	Subproject 2: Step 2 and Step 3 of Autonomous Maintenance					■	■	■	■				
5	Subproject 3: Focused Improvement through Kaizens			■	■	■	■	■	■				
6	Subproject 4: Planned Maintenance									■	■	■	■
7	Project close out and handover											■	■

Item	Objective Description	Timeline 2014											
		J	F	M	A	M	J	J	A	S	O	N	D
1	Subproject 4: Continuing Planned Maintenance Step 0 and Step 1	■	■	■	■	■							
2	Subproject 5: Implementation of Step 4		■	■	■	■	■	■	■	■	■	■	■
3	Subproject 6: Planned Maintenance Step 2						■	■	■	■			
4	Subproject 7: Planned Maintenance Step 3										■	■	■

Benefits (KPI's)

KPI	Before	After	Value of Savings to date
Output	170 kg/hr	211.8 kg/hr	R 427 374.16
Downtime (maintenance) allowance of 5% of production	194 Planned hours	109 productio hours	R 40 205
Number of wire breaks	12 p/week	8 p/week	R 15 254. 25
Labour cost	R 280 per ton	R 269.59 per ton	R 199 438.40
Kaizens Suggestions	0	11	N/A
		Total	R682 271.82

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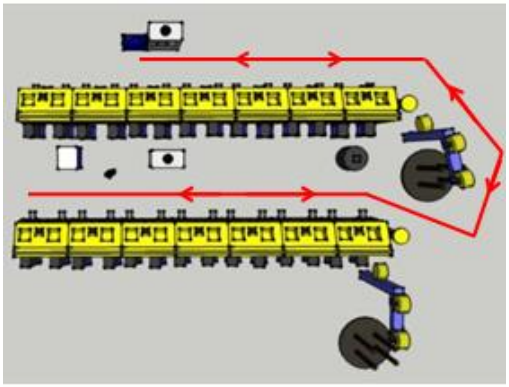
Before



After

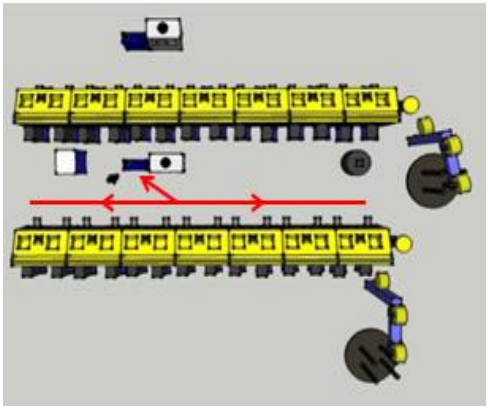


Figure 6: An extra welder and pointer was refurbished and placed at the machine eliminating the operator to throw the wire over the machine.

Figure 7: Initial cleaning Step 1 of Autonomous Maintenance

Sustainability (From AIDC's viewpoint)

One of the advantages that TPM brings is that the results obtained in the model area can be leveraged across to other areas.

Natstan managers are demonstrating team support by taking part in horisontal deployment with the assistance of the AIDC ensuring sustainability of the programme through involving the shop floor employees to drive the programme.

Way Forward

- To increase machine efficiency, consistent with Natstan's goal to reach a smooth stream of operations with zero defects and breakdowns
- Preparing the machine to be able to run from 14m/s to a speed of 18m/s. Current increased speed is 17m/s
- Elimination of sources of contamination
- Hard to access areas to be addressed
- Sustaining implemented work through work standards and audits
- Horisontal deployment – Drawing machines MF1, HD2 and Rodmill Step 1 and Step 2 Implementation (roll out done by Natstan to ensure sustainability of TPM)
- Sustainability and consistency of operator involvement. Capturing of data and problem solving of own equipment.

CONTACT DETAILS

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